

**DECLARATION UNDER 37 C.F.R. 1.132**

I, Dr. Hyunkook Shin, do hereby declare as follows:

1. I was granted a Bachelor of Science in Chemical Engineering from the Massachusetts Institute of Technology in 1962, and a Doctor of Science in Chemical Engineering from the Massachusetts Institute of Technology in 1965.
2. I have worked for the assignee of this patent application no. 09/691,273, E.I. du Pont de Nemours and Company since 1965 and am an expert in Flash Spinning Technology.
3. I am a coinventor of the cited reference, U.S. Patent no. 5,147,586, to Shin et al., and an expert in the art of flash spinning of polyolefin fibers. I have been informed of the Examiner's rejection of claims 28-30 in the present application over my patent no. 5,147,586, and the Examiner's position that the fibers made in my patent and sheets made therefrom would inherently have the physical characteristics set forth in claims 28-30.
4. I disagree with the Examiner's conclusion that the flash spun fibers formed according to Shin et al. would inherently make fibers and/or sheet materials having the limitations set forth in claims 28-30.
5. The exemplary data set forth in Shin et al., the base reference used in the outstanding rejection, was prepared using a twin-piston device, as described at column 10, line 20 to column 12, line 17. The twin-piston device is useful in conducting preliminary experiments in fiber spinning techniques. However, the twin piston device cannot be used to form sheets and therefore cannot be relied upon for predicting finished sheet properties, even by an expert in the art. In view of the distinctions between the apparatuses used in Shin et al. and in the present invention, the Examiner's statement that

although the prior art [Shin et al.] does not explicitly disclose a non-woven having the desired combination of crush value, surface area, Frazier Permeability, hydrostatic head, and Gurley Hill Porosity values it is reasonable to presume that said property values are inherent to the plexifilamentary film-fibrils of Shin et al., and any subsequent non-woven formed therefrom. Support for said presumption is found in the use of like materials (i.e.,

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polyethylene/pentane/cyclopentane) and the use of like processes (flash-spun plexi-filamentary filaments at a temperature ranging from 130° C to 300° C), which would result in the claimed propert[ies]...(Office Action, page 9),

is an inappropriate over-simplification of the similarities between the fiber formation processes of my Shin et al. patent and the fiber/sheet formation processes of the present application, and is inaccurate.

The following experiments were conducted under my supervision and control.

6. The exemplary data of U.S. Patent no. 5,147,586 was reviewed to select samples which were flash-spun under temperature, solvent and concentration conditions as close as possible to those set forth in claims 28-30. In selecting the examples, only polyethylene fibers which were spun in hydrocarbon (Table 5) or hydrocarbon-based mixed spin liquids (Table 6) and having a "Fib. Level" of "FINE" or "VERY FINE" were considered likely to be within the scope of the presently rejected claims.

Example # (Table/No.)	Polymer Conc. (Wt%)	Solvent(s)	Spin Temp. (°C)
5/9	15	hexane	230
6/1	15	CycloC <sub>6</sub> /methanol	230
6/9	15	Heptane/ethanol	230
6/11	15	Heptane/ethanol	230
6/14	15	Hexane/methanol	230

7. The samples set forth in paragraph 6 above were retrieved from storage and sent to our laboratory for measurement of the BET Surface Area, so as to permit a comparison with the limitations of presently rejected claim 28, which requires a surface area of less than 10 m<sup>2</sup>/g. The BET Surface Areas of the selected samples are set forth below.

Example # (Table/No.)	Sample no.	BET SA (m <sup>2</sup> /g)
5/9	P11085-94	14.2
6/1	P11046-76	14.7
6/9	P11046-86	17.6
6/11	P11085-74	17.3
6/14	P11046-88	20.8

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8. Clearly, these Shin et al. examples do not necessarily or inherently make fibers which could be formed into sheets having the claimed properties.
9. I further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Hyunkook Shin  
Hyunkook Shin

10/7/03  
date

**DECLARATION UNDER 37 C.F.R. 1.132**

I, Dr. Hyun Sung Lim, do hereby declare as follows:

1. I was granted a Bachelor of Science in Chemical Engineering from the University of Illinois-Champaign in 1975, and a Doctor of Philosophy in Chemical Engineering from the Georgia Institute of Technology in 1982.
2. I have worked for the assignee of this patent application no. 09/691,273, E.I. du Pont de Nemours and Company since 1982 and am an expert in Flash Spinning Technology.
3. I am a coinventor of the cited references, U.S. Patent nos. 5,290,628 (the '628 Patent) and 6,034,008 (the '008 Patent), both to Lim et al., and an expert in the art of flash spinning of polyolefin fibers. I have been informed of the Examiner's rejection of claims 28-30 in the present application over my patent nos. 5,290,628 and 6,034,008, and have read and considered the Examiner's position in each instance.
4. As to the Examiner's finding with respect to the '628 Patent that the fabrics and process disclosed therein would form a "unitary fibrous sheet" within the meaning set forth in the present application, I disagree. Even when hydraulically needled according to the '628 Patent, the sheets so formed and processed had two distinctly different sides: a first side which remained essentially a flash spun polyethylene sheet layer, and a second side which remained essentially a staple fiber sheet layer. The staple fibers were not hydraulically needled into the flash spun sheet to the extent that the staple fiber layer entirely lost its identity, nor do I believe such would be possible.
5. As to the '008 Patent, I disagree with the Examiner's finding that it was possible at the time the invention was made to merely choose among various disclosed ranges of hydrohead and Gurley Hill porosity to obtain a fabric having the combination of properties claimed in the present application. The properties of water resistance (hydrohead) and air permeability (Gurley Hill porosity) are competing characteristics of any fabric, and it is generally known in the art that processing techniques which increase hydrohead result in a decrease in air permeability (an increase in the Gurley Hill number). The chemistry of the polymer(s) and structure of the plexifilaments in the flash spun fabrics of my '008 Patent is not necessarily determinative of their barrier and permeability properties, in contrast to the Examiner's findings to the contrary. Further, I declare

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that none of the sheets disclosed in my '008 Patent had combinations of hydrohead and Gurley Hill within the presently claimed ranges.

6. I further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Hyun Sung Lim

Hyun Sung Lim

November 10, 2003

date